ATEC Associates, Inc.
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June 24, 1981

Reid, Quebe, Allison, Wilcox & Associates, Inc.
120 W. LaSalle Street
Suite 606
South Bend, Indiana 46601

Attention: Mr. Dennis M. Neidigh, P.E.
Project Director

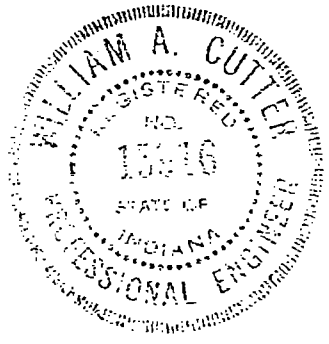
Re: Geotechnical Investigation
Final Report
Milepost 10-SR 912 South Interchange
Indiana Toll Road Improvement
Gary, Indiana
ATEC Associates Project 21-03189-10

Gentlemen:

Submitted herewith is our final report for the geotechnical engineering study conducted for the 1980 improvements to the East-West Indiana Toll Road. This report pertains specifically to Milepost 10. This study was conducted in accordance with our agreement with the Indiana Toll Road Commission dated October 10, 1980.

This report contains the findings of our field and laboratory studies, and an engineering interpretation of the existing conditions as they pertain to the proposed toll road improvements. Recommendations are provided to aid in the design of foundations or other earth-related components.

We appreciate the opportunity to be of service to you on this project. If we can be of any further assistance, please contact this office.



Very truly yours,

ATEC Associates, Inc.

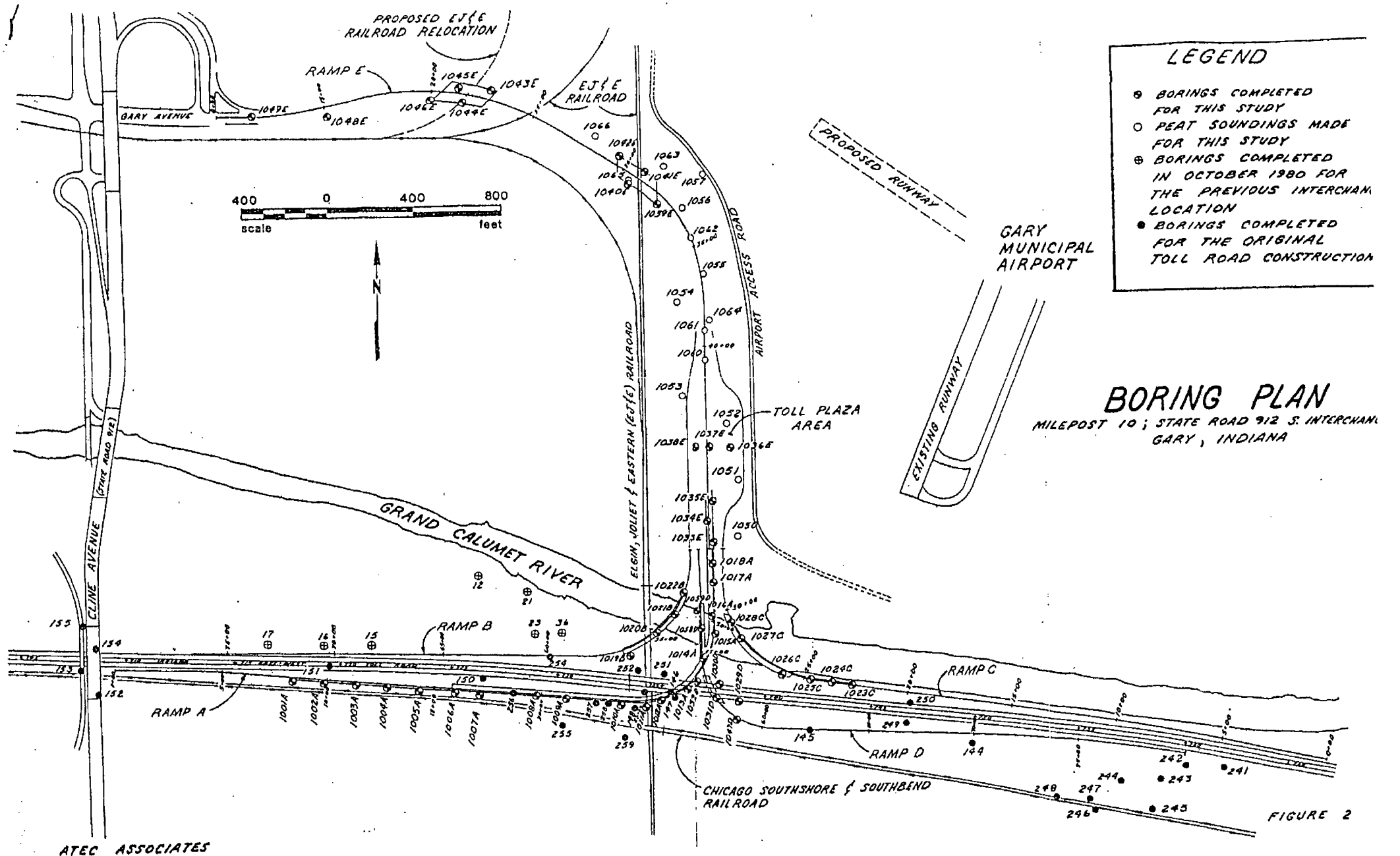
M. Surendra

M. Surendra, Ph.D.
Staff Engineer

William A. Cutter

William A. Cutter, P.E.
Senior Project Engineer
Project Coordinator

bl/TOLL4:V
Copies: (5) RQAW, South Bend
(1) Lawson-Fisher Associates


PROPOSED EJ&E RAILROAD RELOCATION
RAMP E
EJ&E RAILROAD
GARY AVENUE
PROPOSED RUNWAY
GARY MUNICIPAL AIRPORT
EXISTING RUNWAY
AIRPORT ACCESS ROAD
ELGIN, JOLIET & EASTERN (EJ&E) RAILROAD
CLINE AVENUE (STATE ROAD 912)
GRAND CALUMET RIVER
TOLL PLAZA AREA
RAMP A
RAMP B
RAMP C
RAMP D
CHICAGO SOUTHSHORE & SOUTHBEND RAILROAD
400 0 400 800
scale
feet
N
LEGEND
BORINGS COMPLETED FOR THIS STUDY
PEAT SOUNDINGS MADE FOR THIS STUDY
BORINGS COMPLETED IN OCTOBER 1980 FOR THE PREVIOUS INTERCHAN LOCATION
BORINGS COMPLETED FOR THE ORIGINAL TOLL ROAD CONSTRUCTION
BORING PLAN
MILEPOST 10 ; STATE ROAD 912 S. INTERCHAN
GARY, INDIANA
FIGURE 2
ATEC ASSOCIATES

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1010A

CLIENT Indiana Toll Road Commission
PROJECT NAME 1980 Indiana Toll Road Improvement Project
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange
BORING LOCATION Station 733+28; 116' Rt.
FOREMAN D. White
INSPECTOR -

JOB NO. 21-03189-10
DATE 03-12-81
BORING METHOD CA/RC
ROCK CORE DIA. 2.0 IN.
SHELBY TUBE DIA. - IN.

MATERIAL DESCRIPTION	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION SAMPLE NO.	STD. PENETRATION BLOWS/6 IN; THREE 6 IN. INCREMENTS	STD. PENETRATION RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
SURFACE ELEVATION 591.1							
TOPSOIL	0.4						
Brown to Dark Brown slightly moist medium dense fine SAND (SP) with trace Silt (SAND)**	5.5	5	1	9 11/13	75		**Soil classification by Textural Classification System
			2	4 6/12	50		
Brown wet dense fine SAND (SP) with trace Silt (SAND)**	12.0	10	3	11 18/28	50		
			4	9 18/22	50		
Gray moist very dense fine SAND (SP) with trace Silt (SAND)**	22.0	15	5	18 24/31	75		
		20	6	23 36/45	75		
Gray wet very dense SILTY fine SAND (SM) (SANDY LOAM)**	31.5	25	7	26 44/40	100		
		30	8	16 27/34	100		
Gray moist medium dense fine SAND (SP) with trace Silt (SAND)**	35.5	35	9	18 18/10	100		
Gray moist stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**		40	10	5 6/7	100		

WATER LEVEL OBSERVATIONS
NOTED ON RODS - FT.
AT COMPLETION - FT.

BORING METHOD
HSA — HOLLOW STEM AUGER
CFA — CONTINUOUS FLIGHT AUGER
DC — DRIVEN CASING
MD — MUD DRILLING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1010A

CLIENT Indiana Toll Road Commission — JOB NO. 21-03189-10
PROJECT NAME 1980 Indiana Toll Road Improvement Project — DATE 03-12-81
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange — BORING METHOD CA/RC
BORING LOCATION Station 733+28; 116' Rt. — ROCK CORE DIA. 2.0 IN.
FOREMAN D. White — SHELBY TUBE DIA. - IN.
INSPECTOR

MATERIAL DESCRIPTION SURFACE ELEVATION 591.1	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION: SAMPLE NO.	STD. PENETRATION: BLOWS/6 IN; THREE 6 IN INCREMENTS	STD. PENETRATION: RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Gray moist stiff to very stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**		40	11	5 7/9	100		**Soil classification by Textural Classification System
		45	12	4 5/7	100		
		50	13	4 5/7	100		
		55	14	4 7/7	100		
	59.5	60					Borehole advanced using rotary drilling technique below 60.0'
Gray moist stiff to medium stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**			15	4 4/7	100		
		65	16	3 4/7	100		
		70	17	4 4/5	100		
		75	18	7 7/9	100		
Gray slightly moist hard SILTY CLAY (CL) with little fine to coarse Sand and trace Gravel (CLAY)**	78.5	80					

WATER LEVEL OBSERVATIONS
NOTED ON RODS - FT.
AT COMPLETION - FT.
AFTER - HRS. - FT.

BORING METHOD
HSA — HOLLOW STEM AUGER
CFA — CONTINUOUS FLIGHT AUGER
DC — DRIVEN CASING
MD — MUD DRILLING
RC — ROCK CORING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1010A

CLIENT Indiana Toll Road Commission
PROJECT NAME 1980 Indiana Toll Road Improvement Project
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange
BORING LOCATION Station 733+28; 116' Rt.
FOREMAN D. White
INSPECTOR -

JOB NO. 21-03189-10
DATE 03-12-81
BORING METHOD CA/RC
ROCK CORE DIA. 2.0 IN.
SHELBY TUBE DIA. - IN.

MATERIAL DESCRIPTION SURFACE ELEVATION 591.1	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION: SAMPLE NO.	STD. PENETRATION: BLOWS/6 IN. THREE 6 IN. INCREMENTS	STD. PENETRATION: RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Gray slightly moist hard SILTY CLAY (CL) with little fine to coarse Sand and trace Gravel		80	19	8 16/21	100		**Soil classification by Textural Classification System
(CLAY)**	85.1	85	20	50 0.1	0		
Gray, slightly weathered, with a little solutioning, hard, very close to closely jointed, fine grained to crystalline dolomitic LIMESTONE with oil - tar filled cavities		90		RC Run No. 1	83		Rock Core Run #1: 85.1' to 95.1' RQD = 34%
Bottom of Test Boring @ 95.1'		95					

WATER LEVEL OBSERVATIONS
NOTED ON RODS - FT.
AT COMPLETION - FT.
AFTER - HRS - FT.

BORING METHOD
HSA — HOLLOW STEM AUGER
CFA — CONTINUOUS FLIGHT AUGER
DC — DRIVEN CASING
MD — MUD DRILLING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.

Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1022B

CLIENT Indiana Toll Road Commission — JOB NO. 2103189-10
PROJECT NAME 1980 Indiana Toll Road Improvement Project — DATE 3/28/81
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange — BORING METHOD HSA
BORING LOCATION Station 735+75; 460' Lt. — ROCK CORE DIA. – IN.
FOREMAN R. Groves/K. Cardinal — SHELBY TUBE DIA. – IN.
INSPECTOR –

MATERIAL DESCRIPTION (SURFACE ELEVATION 584.2)	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION: SAMPLE NO.	STD. PENETRATION: BLOWS/6 IN; THREE 6 IN. INCREMENTS	STD. PENETRATION: RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Brown dry very loose organic SILTY SAND (SM) (SANDY LOAM)**	3.0		1	1 1/1	10		**Soil classification by Textural Classification System
Gray wet loose fine SAND (SP) with trace Silt (SAND)**		5	2	4 5/5	80		
			3	2 3/3	70		
		10	4	3 5/4	70		
		15	5	4 4/8	40		
		20	6	5 6/12	100		
		25	7	8 10/14	100		
	28.5						
Wood layer	30.0	30	8	10 10/12	60		
Gray moist very stiff SILTY CLAY (CL) with trace fine to coarse Sand and Gravel		35	9	8 10/10	100		Borehole advanced using rotary drilling technique below 35.0 ft.
		40	10	8 11/14	100		

WATER LEVEL OBSERVATIONS
NOTED ON RODS 3.5 FT.
AT COMPLETION – FT.

BORING METHOD
HSA — HOLLOW STEM AUGER
CFA — CONTINUOUS FLIGHT AUGER
DC — DRIVEN CASING
MD — MUD DRILLING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1022B

CLIENT Indiana Toll Road Commission — JOB NO. 2103189-10
PROJECT NAME 1980 Indiana Toll Road Improvement Project — DATE 3/28/81
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange — BORING METHOD HSA
BORING LOCATION Station 735+75; 460' Lt. — ROCK CORE DIA. - IN.
FOREMAN R. Groves/K. Cardinal — SHELBY TUBE DIA. - IN.
INSPECTOR -

MATERIAL DESCRIPTION (SURFACE ELEVATION 584.2)	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION: SAMPLE NO.	STD. PENETRATION: BLOWS/6 IN. THREE 6 IN. INCREMENTS	STD. PENETRATION: RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Gray moist medium stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**		45	11	4 4/5	100		**Soil classification by Textural Classification System
		50	12	3 4/4	100		
Gray moist very stiff SILT (ML) with a little Clay (SILT)**	52.0 56.0	55	13	13 14/13	80		
Gray moist stiff to very stiff SILTY CLAY (CL) with a little fine to coarse Sand and trace Gravel (CLAY)**		60	14	5 6/7	100		
		65	15	5 5/7	100		
		70	16	6 7/8	100		
		75	17	6 9/11	40		Two attempts were made to recover Sample No. 17.
Gray moist very stiff SILTY CLAY (CL) with little fine to coarse Sand and trace Gravel with some very thin Silt seams (CLAY)**	77.0	80	18	8 10/13	100		

WATER LEVEL OBSERVATIONS
NOTED ON RODS 3.5 FT.
AT COMPLETION - FT.
AFTER - HRS. - FT.

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING
RC —ROCK CORING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1022B

CLIENT Indiana Toll Road Commission — JOB NO. 2103189-10
PROJECT NAME 1980 Indiana Toll Road Improvement Project — DATE 3/28/81
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange — BORING METHOD HSA
BORING LOCATION Station 735+75; 460' Lt. — ROCK CORE DIA. - IN.
FOREMAN R. Groves/K. Cardinal — SHELBY TUBE DIA. - IN.
INSPECTOR -

MATERIAL DESCRIPTION (SURFACE ELEVATION 584.2)	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION: SAMPLE NO.	STD. PENETRATION: BLOWS/6 IN; THREE 6 IN. INCREMENTS	STD. PENETRATION: RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Gray moist very dense SILTY CLAY (CL) with little fine Sand and fine Gravel (CLAY)**	82.0						**Soil classification by Textural Classification System
Gray slightly moist hard SILTY CLAY (CL) with some fine to coarse Sand and trace Gravel (CLAY)**	88.0	85	19	25 40/50 0.3	100		
Gray slightly moist hard SILTY SAND (SM) with little clay (SANDY LOAM)**	89.6	90	20	39 50/0.2	100		[C]Borehole caved to 4.0' upon completion.
Gray slightly moist hard SANDY SILT (ML) with little Clay (SILTY LOAM)**		95					
Bottom of Test Boring @ 93.2'							

WATER LEVEL OBSERVATIONS
NOTED ON RODS 3.5 FT.
AT COMPLETION - FT. [C]

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING

[C]THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET

AIEC Associates, Inc.

Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1039E

CLIENT Indiana Toll Road Commission — JOB NO. 2103189-10
PROJECT NAME 1980 Indiana Toll Road Improvement Project — DATE 4/2/81
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange — BORING METHOD HSA
BORING LOCATION Station 733+75; 2290' Lt. — ROCK CORE DIA. – IN.
FOREMAN R. Hackman — SHELBY TUBE DIA. – IN.
INSPECTOR M. Surendra

MATERIAL DESCRIPTION (SURFACE ELEVATION 589.6)	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION: SAMPLE NO.	STD. PENETRATION: BLOWS/6 IN.; THREE 6 IN. INCREMENTS	STD. PENETRATION: RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Brown moist loose to medium dense fine SAND (SP) with trace Silt (SAND)**			1	1 3/3	100		**Soil classification by Textural Classification System
		5	2	4 5/6	100		
-wet below 6.0'			3	3 3/4	80		Introduced water below 7.5 ft to maintain a stable hole
		10	4	3 4/7	100		
	13.0						
Gray wet dense fine SAND (SP) with trace Silt and trace Shells (SAND)**		15	5	9 19/23	80		
		20	6	9 21/40	100		
		25	7	8 26/42	100		
		30	8	12 28/38	100		
		35	9	9 13/18	60		
Gray moist SILTY CLAY (CL) with trace fine Sand and trace Shells (CLAY)**	39.0	40	10	3 3/4	100		Two samples taken

WATER LEVEL OBSERVATIONS
NOTED ON RODS 7.5 FT.
AT COMPLETION – FT.
AFTER – HRS. – FT.

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING
RC —ROCK CORING
CA —CASING ADVANCER

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.

Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1039E

CLIENT Indiana Toll Road Commission — JOB NO. 2103189-10
PROJECT NAME 1980 Indiana Toll Road Improvement Project — DATE 4/2/81
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange — BORING METHOD HSA
BORING LOCATION Station 733+75; 2290' Lt. — ROCK CORE DIA. – IN.
FOREMAN R. Hackman — SHELBY TUBE DIA. – IN.
INSPECTOR M. Surendra

MATERIAL DESCRIPTION SURFACE ELEVATION 589.6	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION SAMPLE NO.	BLOWS/6 IN; THREE 6 IN. INCREMENTS	RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Gray moist soft to medium stiff SILTY CLAY (CL) with trace fine Sand and trace Shells and trace Gravel			11	3 5/5	100		
		45	12	3 3/5	100		Borehole advanced using rotary drilling technique below 45.0'
(CLAY)**							
		50	13	2 4/4	100		
			14	3 5/5	100		**Soil classification by Textural Classification System
		55					
		60	15	3 4/5	100		
			16	2 3/3	100		
	66.0	65					
Gray slightly moist soft SILTY CLAY (CL) with trace fine Sand and trace Gravel			17	2 3/5	100		Sampler was sunk from 66.0 to 66.5 ft under its own weight.
-moist below 68.0'			18	3 4/5	100		
		70					
(CLAY)**							
-some fine to medium Sand from 74.5 to 75.0'			19	3 4/4	100		
		75					
			20	6 5/6	100		
		80					

WATER LEVEL OBSERVATIONS
NOTED ON RODS 7.5 FT.
AT COMPLETION – FT.
AFTER – HRS – FT.

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1039E

CLIENT Indiana Toll Road Commission — JOB NO. 2103189-10
PROJECT NAME 1980 Indiana Toll Road Improvement Project — DATE 4/2/81
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange — BORING METHOD HSA
BORING LOCATION Station 733+75; 2290' Lt. — ROCK CORE DIA. – IN.
FOREMAN R. Hackman — SHELBY TUBE DIA. – IN.
INSPECTOR M. Surendra

MATERIAL DESCRIPTION (SURFACE ELEVATION 589.6)	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION SAMPLE NO.	BLOWS/6 IN; THREE 6 IN. INCREMENTS	RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Gray moist meduim stiff SILTY CLAY (CL) with trace to some fine Sand and trace Gravel (CLAY)**		85	21	4 4/8	100		**Soil classification by Textural Classification System
		90	22	5 7/10	100		
	90.5						
Gray slightly moist hard SILTY CLAY (CL) with trace Sand and trace Gravel (CLAY)**		95	23	18 26/32	100		
		100	24	20 35/38	100		
		105	25	15 20/33	60		
		110	26	22 20/30	100		
Bottom of Test Boring @ 110.0'							

WATER LEVEL OBSERVATIONS
NOTED ON RODS 7.5 FT.
AT COMPLETION – FT.

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET

ATEC Associates, Inc.

Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1040E

CLIENT Indiana Toll Road Commission
PROJECT NAME 1980 Indiana Toll Road Improvement Project
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange
BORING LOCATION Station 732+50; 2380' Lt.
FOREMAN R. Hackman
INSPECTOR A. Spencer

JOB NO. 2103189-10
DATE 4/10/81
BORING METHOD HSA
ROCK CORE DIA. - IN.
SHELBY TUBE DIA. - IN.

MATERIAL DESCRIPTION (SURFACE ELEVATION 584.6)	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION SAMPLE NO.	STD. PENETRATION BLOWS/6 IN; THREE 6 IN INCREMENTS	STD. PENETRATION RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Dark Brown moist loose SILTY organic SAND (SM) with roots (SANDY LOAM)**	1.5		1	2 3/4	80		Two samples taken
Brownish Gray wet loose fine to medium SAND (SP) with trace Silt (SAND)**	8.0	5	2	2 2/4	100		**Soil classification by Textural Classification System
			3	3 3/5	100		
Gray wet dense to very dense SAND (SM) with little Silt -very thin wood seam at 9.5' (SANDY LOAM)**		10	4	12 16/25	100		
		15	5	15 38/50 0.4	100		
		20	6	17 28/33	100		
		25	7	15 23/28	100		
	27.0						
Gray wet medium dense very fine SAND (SM) with little Silt (SANDY LOAM)**	32.5	30	8	8 12/17	75		
Gray moist medium stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace small Gravel (CLAY)**		35	9	3 3/4	90		
Bottom of Test Boring @ 35.0'							

WATER LEVEL OBSERVATIONS
NOTED ON RODS 1.0 FT.
AT COMPLETION - FT.

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1046E

CLIENT Indiana Toll Road Commission — JOB NO. 2103189-10.
PROJECT NAME 1980 Indiana Toll Road Improvement Project — DATE 4/7/81
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange — BORING METHOD HSA
BORING LOCATION Station 723+00; 2751' Lt. — ROCK CORE DIA. — IN.
FOREMAN R. Hackman — SHELBY TUBE DIA. — IN.
INSPECTOR A. Spencer

MATERIAL DESCRIPTION SURFACE ELEVATION 586.7	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION SAMPLE NO.	BLOWS/6 IN; THREE 6 IN. INCREMENTS	RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Gray dry very stiff ash with some slag cobbles (FILL)	2.0		1	4 50/0.2	80		**Soil classification by Textural Classification System
Tan dry medium dense fine SAND (SP) with trace Silt (SAND)**		5	2	4 5/7	100		
			3	4 9/13	100		
		10	4	5 7/8	100		
	12.0						
Gray wet dense to medium dense fine SAND (SP) with trace Silt (SAND)**		15	5	8 17/21	100		
		20	6	3 5/12	100		
562.5	24.2		7	14 29/37	100		Two samples taken.
Gray wet very dense fine to coarse SAND (SP) with trace Silt and trace Gravel (SAND)**	24.8	25					
Gray wet medium dense fine SAND (SP) with trace Silt (SAND)**		30	8	8 11/18	100		
-thin fine to coarse Sand seam at 29.0 to 29.2'	33.0						
Gray and Brown wet loose fine to coarse SAND (SP) with little Gravel (SAND)**	36.0	35	9	8 3/3	35		
Gray moist medium stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**			10	3 3/4	100		

WATER LEVEL OBSERVATIONS
NOTED ON RODS 11.0 FT.
AT COMPLETION — FT.

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1046E

CLIENT Indiana Toll Road Commission — JOB NO. 2103189-10
PROJECT NAME 1980 Indiana Toll Road Improvement Project — DATE 4/7/81
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange — BORING METHOD HSA
BORING LOCATION Station 723+00; 2751' Lt. — ROCK CORE DIA. – IN.
FOREMAN R. Hackman — SHELBY TUBE DIA. – IN.
INSPECTOR A. Spencer

MATERIAL DESCRIPTION	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION: SAMPLE NO.	STD. PENETRATION: BLOWS/6 IN; THREE 6 IN. INCREMENTS	STD. PENETRATION: RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
SURFACE ELEVATION 586.7							
Gray moist medium stiff SILTY CLAY (CL) with trace fine to coarse Sand (CLAY)**			11	3 4/5	100		**Soil classification by Textural Classification System
	44.8	45	12	4 4/5	100		
Gray moist medium stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**	48.0						
Gray moist medium stiff SILTY CLAY (CL) with trace fine Sand (CLAY)**	52.5	50	13	3 5/5	80		
Gray moist stiff to medium stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace small Gravel (CLAY)**		55	14	4 5/7	100		
		60	15	4 4/5	100		
-two thin Silty Sand seams from 64.0 to 64.4'		65	16	4 6/6	100		
		70	17	4 4/5	100		
		75	18	4 4/5	100		
		80	19	5 5/7			

WATER LEVEL OBSERVATIONS
NOTED ON RODS 11.0 FT.
AT COMPLETION – FT.

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1046E

CLIENT Indiana Toll Road Commission
PROJECT NAME 1980 Indiana Toll Road Improvement Project
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange
BORING LOCATION Station 723+00; 2751' Lt.
FOREMAN R. Hackman
INSPECTOR A. Spencer

JOB NO. 2103189-10
DATE 4/7/81
BORING METHOD HSA
ROCK CORE DIA. - IN.
SHELBY TUBE DIA. - IN.

MATERIAL DESCRIPTION (SURFACE ELEVATION 586.7)	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION SAMPLE NO.	STD. PENETRATION BLOWS/6 IN; THREE 6 IN. INCREMENTS	STD. PENETRATION RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
Gray moist stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**	80.5						
Gray moist stiff to very stiff SILTY CLAY (CL) with little fine to coarse Sand and trace Gravel (thin fine to coarse Sand seams from 83.5 to 84.0 ft) (CLAY)**	84.0	85	20	9 9/12	100		Two samples taken.
Gray moist very stiff SILTY CLAY (CL) with trace fine to coarse Sand and trace Gravel (CLAY)**	87.0	90	21	17 23/24	80		**Soil classification by Textural Classification System
Gray slightly moist hard CLAYEY SILT (CL-ML) with some fine to coarse Sand and trace Gravel (SILTY CLAY)**	92.0	95	22	18 22/27	100		
Gray slightly moist hard SILTY CLAY (CL) with some fine to coarse Sand and trace Gravel (CLAY)**							
Bottom of Test Boring @ 95.0'							

WATER LEVEL OBSERVATIONS
NOTED ON RODS 11.0 FT.
AT COMPLETION - FT.

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING

*THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET

ATEC Associates, Inc.
Consulting Geotechnical & Materials Engineers

LOG OF BORING NO. 1049E

CLIENT Indiana Toll Road Commission
PROJECT NAME 1980 Indiana Toll Road Improvement Project
PROJECT LOCATION Mile Post 10; State Road 912 South Interchange
BORING LOCATION Station 714+80; 2640' Lt.
FOREMAN R. Hackman
INSPECTOR A. Spencer

JOB NO. 2103189-10
DATE 4/8/81
BORING METHOD HSA
ROCK CORE DIA. - IN.
SHELBY TUBE DIA. - IN.

MATERIAL DESCRIPTION	STRATUM DEPTH, FT.	DEPTH, FT.	STD. PENETRATION SAMPLE NO.	STD. PENETRATION BLOWS/6 IN; THREE 6 IN. INCREMENTS	STD. PENETRATION RECOVERY, %	SHELBY TUBE NO.	BORING AND SAMPLING NOTES
SURFACE ELEVATION 586.1							
TOPSOIL 0.1' Tan dry loose to medium dense fine SAND (SP) with trace Silt (SAND)**		5	1	2 2/2	100		**Soil classification by Textural Classification System
			2	3 4/4	100		
			3	4 7/8	100		
	9.5	10	4	4 9/11	100		Two samples taken.
Gray moist to wet very dense very fine SAND (SP) with trace Silt (SAND)**		15	5	12 20/32	100		
		20	6	15 35/45	100		[c]Borehole caved to 10 ft upon completion.
Bottom of Test Boring @ 20.0'							

WATER LEVEL OBSERVATIONS
NOTED ON RODS 11.2 FT.
AT COMPLETION - FT. [c]
AFTER - HRS - FT

BORING METHOD
HSA—HOLLOW STEM AUGER
CFA—CONTINUOUS FLIGHT AUGER
DC —DRIVEN CASING
MD —MUD DRILLING

[c]THESE SHELBY TUBE SAMPLES OBTAINED IN AN AUXILIARY BORING DRILLED A FEW FEET FROM THIS BORING